

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE**

COLLABO INNOVATIONS, INC.,	)	
	)	
Plaintiff,	)	
	)	
v.	)	Civil Action No. 16-197-JFB-SRF
	)	
OMNIVISION TECHNOLOGIES, INC.,	)	
	)	
Defendant.	)	

MEMORANDUM OPINION¹

I. INTRODUCTION

In this patent infringement action filed by plaintiff Collabo Innovations, Inc. (“Collabo”) against defendant OmniVision Technologies, Inc. (“OmniVision”), Collabo alleges infringement of United States Patent Nos. 7,411,180 (“the ‘180 patent”), 8,592,880 (“the ‘880 patent”), 7,944,493 (“the ‘493 patent”), 7,728,895 (“the ‘895 patent”), and 8,004,026 (“the ‘026 patent”) (the “asserted patents” or the “patents-in-suit”). Presently before the court is the matter of claim construction. This order sets forth the court’s constructions for the disputed claim terms discussed in the briefing and at the *Markman* hearing held on July 12, 2017.

II. BACKGROUND²

A. The Parties

Collabo is a Delaware corporation with its headquarters in Costa Mesa, California. (D.I. 14 at ¶ 1) Collabo is the sole owner by assignment of the patents-in-suit, which are directed to image sensors of semiconductor integrated circuits. (*Id.* at ¶¶ 6-10)

¹ On June 8, 2017, the parties consented to the jurisdiction of the magistrate judge for disposition on claim construction. (D.I. 71)

² Background regarding the patents-in-suit is provided within the construction of the disputed terms. *See* § IV, *infra*.

OmniVision is a Delaware corporation with its principal place of business in Santa Clara, California. (*Id.* at ¶ 2) OmniVision manufactures and sells semiconductor devices, including CMOS image sensors, which are incorporated into consumer electronics such as mobile handsets, tablets, automotive cameras, and gamepads. (*Id.* at ¶¶ 11-12)

B. Procedural Posture

Collabo filed suit against OmniVision on March 29, 2016, alleging that OmniVision makes, uses, offers to sell, and/or imports into the United States semiconductor devices, including complementary metal-oxide semiconductor (“CMOS”) image sensors, which utilize technologies covered by the patents-in-suit. (D.I. 1 at ¶ 11) On July 19, 2016, this action was referred by Judge Robinson for discovery and all motions to dismiss, amend, transfer, and any discovery motions permitted. (D.I. 24) The parties completed briefing on claim construction on May 11, 2017. (D.I. 49; D.I. 55; D.I. 60; D.I. 63) On June 8, 2017, the parties consented to the jurisdiction of the magistrate judge for disposition on claim construction. (D.I. 71) A *Markman* hearing was held on July 12, 2017.

III. LEGAL STANDARD

Construing the claims of a patent presents a question of law, although subsidiary fact finding is sometimes necessary. *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 837-38 (2015) (citing *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 977-78 (Fed. Cir. 1995), *aff’d*, 517 U.S. 370, 388-90 (1996)). “It is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (internal quotation marks omitted). “[T]here is no magic formula or catechism for conducting claim construction.” *Id.* at 1324. Instead, the

court may attach the appropriate weight to appropriate sources “in light of the statutes and policies that inform patent law.” *Id.*

The words of the claims “are generally given their ordinary and customary meaning,” which is “the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” *Phillips*, 415 F.3d at 1312-13 (internal citations and quotation marks omitted). “[T]he ordinary meaning of a claim term is its meaning to the ordinary artisan after reading the entire patent.” *Id.* at 1321 (internal quotation marks omitted); *see also Eon Corp. IP Holdings v. Silver Spring Networks, Inc.*, 815 F.3d 1314, 1320 (Fed. Cir. 2016). Claim terms are typically used consistently throughout the patent, and “usage of a term in one claim can often illuminate the meaning of the same term in other claims.” *Phillips*, 415 F.3d at 1314 (observing that “[o]ther claims of the patent in question, both asserted and unasserted, can also be valuable sources of enlightenment . . . [b]ecause claim terms are normally used consistently throughout the patent . . .”).

It is likewise true that “[d]ifferences among claims can also be a useful guide For example, the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.” *Id.* at 1314-15 (internal citation omitted). This “presumption is especially strong when the limitation in dispute is the only meaningful difference between an independent and dependent claim, and one party is urging that the limitation in the dependent claim should be read into the independent claim.” *SunRace Roots Enter. Co., Ltd. v. SRAM Corp.*, 336 F.3d 1298, 1303 (Fed. Cir. 2003) (citing *Ecolab Inc. v. Paraclipse, Inc.*, 285 F.3d 1362, 1375 (Fed. Cir. 2002).

Other intrinsic evidence, including the patent specification, “is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the

meaning of a disputed term.” *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). “[T]he specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor’s lexicography governs.” *Phillips*, 415 F.3d at 1316 (citing *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002)). It bears emphasis that “[e]ven when the specification describes only a single embodiment, the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction.” *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004) (internal quotation marks omitted), *aff’d*, 481 F.3d 1371 (Fed. Cir. 2007). The specification “is not a substitute for, nor can it be used to rewrite, the chosen claim language.” *SuperGuide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004).

In addition to the specification, a court “should also consider the patent’s prosecution history, if it is in evidence.” *Markman*, 52 F.3d at 980. The prosecution history, which is also “intrinsic evidence,” “consists of the complete record of the proceedings before the PTO [Patent and Trademark Office] and includes the prior art cited during the examination of the patent.” *Phillips*, 415 F.3d at 1317. “[T]he prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be.” *Id.*

A court also may rely on “extrinsic evidence,” which “consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises.” *Markman*, 52 F.3d at 980. For instance, technical dictionaries can assist the

court in determining the meaning of a term to those of skill in the relevant art because such dictionaries “endeavor to collect the accepted meanings of terms used in various fields of science and technology.” *Phillips*, 415 F.3d at 1318. In addition, expert testimony can be useful “to ensure that the court’s understanding of the technical aspects of the patent is consistent with that of a person of skill in the art, or to establish that a particular term in the patent or the prior art has a particular meaning in the pertinent field.” *Id.* Nonetheless, courts must not lose sight of the fact that “expert reports and testimony [are] generated at the time of and for the purpose of litigation and thus can suffer from bias that is not present in intrinsic evidence.” *Id.* (“[C]onclusory, unsupported assertions by experts as to the definition of a claim term are not useful to a court.”). Overall, while extrinsic evidence may be useful to the court, it is less reliable than intrinsic evidence, and its consideration “is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence.” *Id.* at 1318-19.

Finally, “[t]he construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.” *Renishaw PLC v. Marposs Societa’ Per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998). It follows that “a claim interpretation that would exclude the inventor’s device is rarely the correct interpretation.” *Osram GmbH v. Int’l Trade Comm’n*, 505 F.3d 1351, 1358 (Fed. Cir. 2007).

IV. CONSTRUCTION OF DISPUTED TERMS

A. Claim Construction of the '180 Patent

The parties represent that, after continued meet and confers, they have reached agreement on the disputed claim terms in the '180 patent. (7/12/17 Tr. at 79:15-80:11) In accordance with the parties' agreement, the claim terms of the '180 patent shall be construed in the following manner:

Term	Agreed Construction
"transparent film" ('180 patent, claim 1)	"a clear layer of material that allows light to pass through"
"transparent film on said micro-lenses" ('180 patent, claim 1)	"transparent film directly on said micro-lenses"
"micro-lenses" ('180 patent, claims 1 & 2)	"multiple miniature bodies of material wherein each body is for focusing light"

B. Claim Construction of the '895 Patent

The '895 patent, entitled "Solid-state image sensing device having shared floating diffusion portions," teaches ways to reduce the size of each pixel by allowing different pixels to share common parts. ('895 patent, col. 1:25-37) Specifically, the '895 patent teaches arranging the floating diffusion portions in a specific configuration to be shared among photoelectric conversion portions, thereby reducing the overall size. (*Id.* at col. 2:1-4) The reduction in pixel size allows designers of digital cameras, smart phones, and other devices containing image sensors to fabricate image sensors with a larger number of pixels on the same size chip as used in previous designs. ('895 patent, col. 1:22-37; D.I. 50 at ¶ 16)

1. “pixel signal” (‘895 patent, claims 1, 3, 5)

Collabo	OmniVision	Court
“an electrical charge or voltage or current indicative of the intensity of light incident on the photoelectric portion of a pixel”	Plain and ordinary meaning; alternatively, “electrical signal converted from incident light on the photoelectric conversion portion of a pixel”	“an electrical charge or voltage or current indicative of the intensity of light incident on the photoelectric portion of a pixel”

The court adopts Collabo’s proposed construction, which finds support in the intrinsic record. The specification teaches that the solid-state image sensing device includes “a plurality of unit pixels . . . each of which outputs a pixel signal according to incident light.” (‘895 patent, col. 2:5-9; *see also* Abstract) This teaching mirrors the language of independent claim 1. (‘895 patent, col. 10:28-30) Accordingly, the claimed “pixel signal” is output from the “unit pixel.” (7/12/17 Tr. at 26:19-27:23)

Collabo’s proposed construction defines “signal” as “charge or voltage or current,” providing definitional language for the disputed term. (7/12/17 Tr. at 26:2-18; 32:3-20) The specification states that the pixel signals may be output via the floating diffusion portions and the pixel amplifier transistors. (‘895 patent, col. 7:52-57) The language of dependent claims 3 and 5 reaffirms that accumulated pixel signals in the floating diffusion portion can be read out by the pixel amplifier transistor (‘895 patent, col. 10:46-50; 7/12/17 Tr. at 33:8-17), or received by the vertical signal lines (*Id.* at col. 10:63-11:2; 7/12/17 Tr. at 32:21-33:7). As explained by Collabo’s expert, Dr. Martin Afromowitz, when the charge is transferred from the photoelectric conversion portion of the pixel to the floating diffusion section, a voltage is established on the floating diffusion. (D.I. 61 at ¶ 13)

Contrary to OmniVision’s assertion, the intrinsic record does not require the pixel signal to be converted from incident light by the photoelectric conversion portion. In a preferred

embodiment, the specification provides that “it is preferable that each of the unit pixels includes: a photoelectric conversion portion which converts the incident light to the pixel signal.” (‘895 patent, col. 2:23-26) It is well-established that the meaning of a claim term may be limited to a preferred embodiment only if there is a finding of lexicography or disavowal, neither of which has been established by OmniVision in the present case. *See GE Lighting Solutions, LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014). Even the absence of an embodiment in the ‘895 patent specification containing a pixel signal which is not converted from incident light would be insufficient to constitute a disavowal. *See Cadence Pharm., Inc. v. Exela PharmSci Inc.*, 780 F.3d 1364, 1369 (Fed. Cir. 2015) (“[E]ven if all of the embodiments discussed in the patent included a specific limitation, it would not be proper to import from the patent’s written description limitations that are not found in the claims themselves.”); *Unwired Planet, LLC v. Apple Inc.*, 829 F.3d 1353, 1359 (Fed. Cir. 2016).

OmniVision’s proposed construction also violates the doctrine of claim differentiation by importing the conversion element from dependent claim 2 into the language of independent claim 1. (D.I. 49 at 11-12; 7/12/17 Tr. at 27:24-28:20) Dependent claim 2 claims that “each of the unit pixels includes: a photoelectric conversion portion which converts the incident light to the pixel signal.” (*Id.* at col. 10:39-41) The doctrine of claim differentiation is at its strongest in the type of case presently before the court, “where the limitation that is sought to be ‘read into’ an independent claim already appears in a dependent claim.” *InterDigital Commc’ns, LLC v. Int’l Trade Comm’n*, 690 F.3d 1318, 1324 (Fed. Cir. 2012) (quoting *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 910 (Fed. Cir. 2004)); *see also SunRace Roots Enter. Co. v. SRAM Corp.*, 336 F.3d 1298, 1303 (Fed. Cir. 2003) (finding that the presumption is especially strong when “the limitation in dispute is the only meaningful difference between an independent and

dependent claim, and one party is urging that the limitation in the dependent claim should be read into the independent claim.”).

The doctrine of claim differentiation creates only a presumption, which “can be overcome by strong contrary evidence such as definitional language in the patent or a clear disavowal of claim scope[.]” *InterDigital Commc’ns, LLC v. Int’l Trade Comm’n*, 690 F.3d 1318, 1324 (Fed. Cir. 2012). As previously discussed, OmniVision does not cite to definitional language in the patent or reference a clear disavowal of claim scope. Instead, OmniVision relies on the language of dependent claim 2, which does not meet the exacting standard for overcoming the doctrine of claim differentiation. Viewing the alleged disavowal in the context of the ‘895 patent as a whole, OmniVision’s proposed limitation is not adequately supported to warrant inclusion in independent claim 1. *See Unwired Planet*, 829 F.3d at 1358.

2. “every two of the unit pixels share a corresponding one of the floating diffusion portions” (‘895 patent, claim 1)

Collabo	OmniVision	Court
Plain and ordinary meaning no construction necessary; alternatively, “two photosensitive elements share the same floating diffusion element”	“there is a 2:1 ratio of unit pixels connected to floating diffusion portions”	“two photosensitive elements share the same floating diffusion element”

The court adopts Collabo’s proposed construction, which is consistent with the intrinsic record. The specification supports a construction allowing a floating diffusion portion to share more than one pair of unit pixels because it repeatedly identifies a “plurality” of unit pixels sharing a floating diffusion portion when referring to the present invention. When describing the problems solved by the invention, the specification notes that “an object of the present invention is to realize a miniaturized and highly sensitive solid-state image sensing device which is

configured such that when a plurality of photodiode portions share a floating diffusion portion, the proportion of the floating diffusion portion with respect to the photodiode portions is small.” (‘895 patent, col. 1:57-63) In identifying the effects of the invention, the specification explains that “it is possible to realize a miniaturized and highly sensitive solid-state image sensing device which is configured such that when a plurality of photodiode portions share a floating diffusion portion, the proportion of the floating diffusion portion with respect to the photodiode portions is small.” (*Id.*, col. 4:40-46) The specification subsequently reiterates that “the proportion of the floating diffusion portion with respect to the photodiode portions is small when a plurality of photodiode portions share a floating diffusion portion.” (*Id.*, col. 10:16-18) The specification’s repeated contemplation of a plurality of photodiode portions sharing one floating diffusion portion conflicts with OmniVision’s proposal that a floating diffusion portion is shared by only one pair of unit pixels.

In support of its proposed construction, OmniVision points to a preferred embodiment in the specification which identifies a single floating diffusion portion shared by one pair of unit pixels: “The read-out transistors respectively provided in two unit pixels which are respectively arranged in adjacent rows and which are respectively arranged in adjacent columns are connected with each other to share the other one of the source and the drain thereof, which forms the FD portion.” (‘895 patent, col. 6:2-8) The specification expressly identifies this iteration of the invention as an embodiment, and does not disavow embodiments in which more than two unit pixels share the same floating diffusion portion. Likewise, Figure 4 depicts a floating diffusion portion sharing two unit pixels and a second floating diffusion portion. (‘895 patent, Fig. 4; col. 6:2-8; 7/12/17 Tr. at 62:2-19) It is well-established that the meaning of a claim term may be limited to a preferred embodiment only if there is a finding of lexicography or disavowal,

neither of which has been established by OmniVision in the present case. *See GE Lighting Solutions, LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014).

3. “in adjacent rows of adjacent columns” (‘895 patent, claim 1)

Collabo	OmniVision	Court
Plain and ordinary meaning no construction necessary; alternatively, “positioned in rows that are next to each other and in columns that are next to each other”	“diagonally”	“positioned in rows that are next to each other and in columns that are next to each other”

The court construes the term in accordance with Collabo’s proposed construction, which is supported by the intrinsic record. The specification includes a preferred embodiment describing unit pixels “which are respectively arranged in adjacent rows and which are respectively arranged in adjacent columns.” (‘895 patent, col. 6:3-5; *see also* Abstract) The use of the “adjacent” language in both the specification and the claim language is more accurately captured by Collabo’s proposed construction.

The specification of the ‘895 patent uses the phrase “diagonally” multiple times when referring to preferred configurations of the floating diffusion portion, but does not expressly disavow embodiments of the unit pixels having other configurations. The specification explains that “it is possible to arrange the FD portion diagonally to the pixels” to reduce the space requirements of the floating diffusion portion, and “it is possible to suppress the occurrence of a misalignment of images even in a case where the FD portion is diagonally arranged.” (‘895 patent, col. 2:15-16; 3:10-12) Acknowledging the possibility of a diagonally-arranged floating diffusion portion in the specification is not sufficient to support its inclusion as a requirement for the unit pixels in the claim language. Figures 2 and 3 depict the diagonal arrangement of a preferred embodiment, but the description of the preferred embodiment contains no limiting

language that would restrict all embodiments to a diagonal configuration. (‘895 patent, col. 6:27-30; 6:61-7:8)

Despite using “diagonally” to describe preferred embodiments of the floating diffusion portion throughout the specification, the inventors did not incorporate the word “diagonally” into the language of the disputed claim itself when referring to the unit pixels. The inventors presumably would have done so had they intended to limit claim 1 of the ‘895 patent in this manner. Absent an express disavowal of claim scope in the specification, the court is not inclined to further limit the claim language by defining it as “diagonally.” *See GE Lighting Solutions, LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014).

C. Claim Construction of the Contact Hole Alignment Patents

The ‘493 patent, the ‘880 patent, and the ‘026 patent (collectively, the “contact hole patents” or “alignment patents”) disclose inventions to minimize the layout size of MOS-type solid-state image sensor devices. (‘493 patent, col. 1:16-19) The common specification of the contact hole patents describe pixels arranged in a matrix of columns and rows, with each pixel containing the following components: a photodiode, a transfer gate, a floating diffusion layer section, an amplifier transistor, a reset transistor, and an address transistor. (‘493 patent, col. 1:26-28) The inventions address the arrangement of the components within the photosensitive cell “to reduce the size of the laid-out photosensitive cells, thereby reducing the entire size of the entire sensor.” (‘493 patent, col. 4:28-30) The specification describes arranging the contact holes in a straight line or eliminating the need for certain contact holes to reduce the space needed for the layout of photosensitive cells. (‘493 patent, col. 4:47-50; 10:3-7)

1. “contact hole” (‘493 patent, claims 10 & 17; ‘880 patent, claim 1) /

“contact” (‘026 patent, claims 1 & 9)

Collabo	OmniVision	Court
“conductive element vertically connecting conducting layers”	“opening for making electrical connection”	“opening for making electrical connection”

The court adopts OmniVision’s proposed construction of “contact hole” and “contact,” which is supported by the intrinsic record. The parties are in agreement that “contact hole” and “contact” should be given the same meaning,³ consistent with the common specification of the ‘493 patent, the ‘880 patent, and the ‘026 patent, which refers only to “contact hole.” (D.I. 60 at 6; 7/12/17 Tr. at 84:5-10) The specification explains that, “[i]n order to electrically connect the region and wires of these three types, contact holes are required for connecting layers.” (‘493 patent, col. 9:41-43) This language supports OmniVision’s position that a contact hole is an opening for routing signals. The specification further explains that contact holes are not required when layers are made of the same material, illustrating that the openings are only necessary to route connections between different layers and materials. (‘493 patent, col. 4:24-28)

The specification contains no express definitional language for “contact” or “contact hole.” In the absence of language in the specification indicating any express definition or specialized meaning, the term should be construed in accordance with its plain and ordinary meaning, i.e., an “opening.” See *Inventio AG v. ThyssenKrupp Elevator Americas Corp.*, C.A.

³ The expert declaration of Collabo’s expert, Martin Afromowitz, states that, “[f]rom the evidence presented herein, it is clear that a [person having ordinary skill in the art] would understand that the claim term ‘contact hole’ is synonymous with ‘contact,’ in the context of the ‘493 patent.” (D.I. 50 at ¶ 87) The term “contact” is used only in claims 1 and 9 of the ‘026 patent. (‘026 patent, col. 14:27-31; col. 15:26-30) Because the parties agree that “contact hole” and “contact” should be given the same meaning, the court rejects Collabo’s argument that OmniVision improperly attempts to “read in the term hole for what is termed contact.” (7/12/17 Tr. at 99:15-18)

No. 08-874-RGA, 2013 WL 842529, at *2 (D. Del. Mar. 6, 2013). This construction is consistent with the position of both parties' experts, who rely on sources demonstrating that a person of ordinary skill in the art would understand a contact hole or contact to refer to an opening to allow electrical connections to be established between layers. (D.I. 50 at ¶ 85, Ex. 14 at 440; D.I. 57 at ¶ 55)

Collabo's proposed construction defining contact holes as "conductive elements" is not adequately supported by the intrinsic evidence. The claims and the specification require only an electrical connection, and do not mention a conductive element. Collabo's support for the "conductive element" language of its proposed construction is limited to the extrinsic record in the form of its expert's declaration. (D.I. 50 at ¶¶ 80, 82) In contrast, the specification describes the "contact hole" as providing an electrical connection, consistent with OmniVision's proposed construction. ('493 patent, col. 11:46-49)

Collabo argues that OmniVision's proposed construction would exclude preferred embodiments of the invention. The preferred embodiment cited by Collabo describes signal lines and gate electrodes made of the same material, which eliminates the need for contact holes to route the referenced signal lines, thereby reducing the circuit size of the sensor. ('026 patent, col. 12:24-30; '493 patent, col. 4:24-30; 4:57-63) However, this embodiment is not the subject of the disputed claims, which expressly require alignment of "contact holes" or "contacts" and cannot be construed to have no "contact holes" or "contacts." For these reasons, Collabo's proposed construction is not adequately supported by the record.

2. “contacts are aligned in a straight line” (‘026 patent, claims 1 & 9)

Collabo	OmniVision	Court
Plain and ordinary meaning no construction necessary; alternatively, “the first, second and third contacts are arranged along a single straight line”	“contact holes are arranged linearly”	“contact holes are arranged along a single straight line”

The court construes the disputed term as follows: “contact holes are arranged along a single straight line.” This construction represents a hybrid of the parties’ competing constructions, as proposed by OmniVision during the July 12, 2017 hearing. (7/12/17 Tr. at 102:1-10) The court previously construed the terms “contact holes” and “contacts” at § IV.C.1, *supra*, and the parties do not dispute that “contact holes” and “contacts” should be given the same meaning, (D.I. 60 at 6; D.I. 50 at ¶ 87).

Applying the court’s prior construction of “contact holes” and “contacts” to the instant claim term resolves the issue of which claim element is arranged in a straight line to reduce the space requirements in the cell layout. The specification describes the contact holes “being aligned approximately in a straight line in the layout of the photosensitive cells” “to reduce an area required for layout of these contact holes.” (‘493 patent, col. 4:47-50; *see also* col. 12:49-51; col. 13:28-35) OmniVision’s proposed construction is consistent with the express language of the specification in this regard.

The court’s construction also addresses Collabo’s objection to OmniVision’s use of the word “linearly.” OmniVision presumably chose the word “linearly” to avoid using the words of the claim itself in the proposed construction. *See Inline Connection Corp. v. AOL Time Warner Inc.*, 347 F. Supp. 2d 56, 72 (D. Del. 2004) (“A construction that does not give meaning to all the words in a disputed phrase is disfavored.”) (citing *Pickholtz v. Rainbow Techs., Inc.*, 284 F.3d

1365, 1373 (Fed. Cir. 2002)). However, the phrase “straight line” does not require construction, and OmniVision’s attempt to rephrase it results in further ambiguity. *See Phillips*, 415 F.3d at 1314 (ordinary and customary meaning may be readily apparent such that “elaborate interpretation” is not required); *O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) (the purpose of claim construction is “to clarify . . . what the patentee covered by the claims . . .”). Accordingly, the court’s proffered construction of the claim term is consistent with the constructions of the previous claim terms, the language of the claims themselves, and the specification.

3. “active region” (‘493 patent, claims 10 & 17; ‘880 patent, claim 1)

Collabo	OmniVision	Court
“a portion of the substrate where transistors, photodiodes, and/or diffusion layers are formed and having a surface area defined by an insulator boundary”	“a contiguous region of the substrate through which charges can flow and where the gate, source, and drain of each transistor is formed”	“a contiguous region of the substrate through which charges can flow and where the gate, source, and drain of each transistor is formed”

The court adopts OmniVision’s proposed construction of “active region,” which is supported by the intrinsic record. The language of the claims recites the term “active region” with no reference to an insulating boundary used to prevent the flow of charge. (‘493 patent, col. 15:21-29, 16:12-21) In accordance with Federal Circuit precedent, the court “cannot endorse a construction analysis that does not identify ‘a textual reference in the actual language of the claim with which to associate a proffered claim construction.’” *MBO Labs., Inc. v. Becton, Dickinson & Co.*, 474 F.3d 1323, 1330-31 (Fed. Cir. 2007) (quoting *Johnson Worldwide Assocs., Inc. v. Zebco Corp.*, 175 F.3d 985, 990 (Fed. Cir. 1999)).

The specification also fails to adequately establish an insulating or isolating boundary as a required characteristic of the active region. In a preferred embodiment, the specification refers

to a device isolation region which surrounds the active region: “The active region is surrounded by a device isolation region (not shown), and has formed therein devices serving as circuits and their electrodes, such as photodiodes, and the gate, source, and drain of each transistor.” (‘493 patent, col. 8:56-59) The device isolation region identified in this portion of the specification is described as a separate component from the active region. To the extent that Collabo asks the court to incorporate the device isolation region into the definition of the active region, the court declines to read extraneous limitations from the specification into the claim term absent lexicography or disavowal. *See Vitronics v. Conceptionic Inc.*, 90 F.3d 1576, 1580 (Fed. Cir. 1996); *E.I. duPont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 1433 (Fed. Cir. 1988) (“By ‘extraneous,’ we mean a limitation read into a claim from the specification wholly apart from any need to interpret what the patentee meant by particular words or phrases in the claim. Where a specification does not require a limitation, that limitation should not be read from the specification into the claims.”).

The court’s construction of this term is consistent with the Patent Trial and Appeal Board’s (“PTAB”) decision in the *inter partes* review proceeding brought by Sony against Collabo, which was issued on October 13, 2016. (D.I. 56, Ex. 1 at 9-12) The PTAB noted that the specification “does not describe insulation,” and the claims “do not recite insulation as part of or accompanying an active region,” concluding that reading an insulation region into the claims would improperly import an extraneous limitation. (*Id.* at 10-11) Although the PTAB’s decision is not binding on this court, it provides additional context for the parties’ positions. *See Inventio AG v. ThyssenKrupp Elevator Americas Corp.*, C.A. No. 08-874-RGA, 2014 WL 129799, at *3 n.2 (D. Del. Jan. 14, 2014).

4. “the first active region” (‘493 patent, claims 10 & 17)

Collabo	OmniVision	Court
“any one of the plurality of corresponding active regions”	Indefinite	Indefinite

The term “the first active region” renders claims 10 and 17 of the ‘493 patent indefinite for lack of antecedent basis. Independent claims 10 and 17 recite “[a]n imaging device formed in a semiconductor substrate, the imaging device comprising” a series of components, including “a plurality of photodiodes arranged in rows and columns, each photodiode for a given row of photodiodes formed in a corresponding active region of the semiconductor substrate.” (‘493 patent, col. 15:21-26; 16:12-17) Subsequent references to “a transfer gate disposed over the first active region” raise questions as to which active region would be “the first” among the plurality of corresponding active regions in each photosensitive cell, as there is no ordinal language earlier in the disputed claims or in the specification in conjunction with the term “active region.” (‘493 patent, col. 15:27; 16:18)

Collabo’s proposed construction, which limits the ‘493 patent to embodiments in which only one active region per photosensitive cell exists, is contradicted by the claim language. The use of the term “comprising” in the preamble of the independent claims signifies that “the named elements are essential, but other elements may be added and still form a construct within the scope of the claim.” *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501 (Fed. Cir. 1997). The “comprising” language of claims 10 and 17 leaves open the option of including more than one active region. (7/12/17 Tr. at 149:15-24)

The language of independent claim 1 further refutes Collabo’s contention that there is only one active region per photosensitive cell. Claim 1 identifies “a corresponding active region,” followed by both “the first active region” and “another active region which is separated

from the corresponding active region.” (‘493 patent, col. 14:1-24) The express designation of “another active region” as “separated from the corresponding region” in claim 1 demonstrates that more than one distinct active region may be present in each photosensitive cell. The active regions in claim 1 are described as the locations where “each photodiode for a given row of photodiodes [is] formed,” where “the amplifier transistor is formed,” and “where the associated floating diffusion element connected to the gate of the amplifier transistor is formed.” (‘493 patent, col. 14:1-4, 14:21-24)

Collabo’s proposal that “the first active region” could be “any one of the plurality of corresponding active regions” does not sufficiently define the term because the claim language suggests that the active regions are not identical, and there is no guidance in the intrinsic record as to which active region would be “the first.”⁴ See *Media Rights Techs., Inc. v. Capital One Fin. Corp.*, 800 F.3d 1366, 1371 (Fed. Cir. 2015) (“A claim . . . is thus invalid for indefiniteness if its language, when read in light of the specification and the prosecution history, ‘fail[s] to inform, with reasonable certainty, those skilled in the art about the scope of the invention.’” (quoting *Nautilus*, 134 S. Ct. at 2124)). Although a failure to provide antecedent basis does not necessarily render a claim indefinite if the scope of the claim would be reasonably understood by a person of ordinary skill in the art, see *Energizer Holdings, Inc. v. Int’l Trade Comm’n*, 435 F.3d 1366, 1370-71 (Fed. Cir. 2006), the claim language at issue in the present case “fail[s] to inform, with reasonable certainty, those skilled in the art about the scope of the invention,” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014); *Eon Corp. IP Holdings*

⁴ The court’s analysis of the disputed term “the floating diffusion layer,” see § IV.C.5, *infra*, is distinguishable from the analysis of “the first active region” term because the specification and claim language of the ‘493 patent do not suggest that all active regions are identical. In contrast, the intrinsic evidence supports the conclusion that the claimed floating diffusion layers are interchangeable.

v. Silver Spring Networks, Inc., 815 F.3d 1314, 1320 (Fed. Cir. 2016). Construing “the first active region” in a manner consistent with Collabo’s proposed construction would require the court to ignore portions of the claims and define the term in a manner inconsistent with both its ordinary meaning and the intrinsic record. In accordance with Federal Circuit precedent, the court may not rewrite “the first active region” to mean “any one of the plurality of corresponding active regions” to give the term meaning. *See Chef Am., Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1374 (Fed. Cir. 2004) (“[C]ourts may not redraft claims, whether to make them operable or to sustain their validity.”).

5. “the floating diffusion layer” (‘026 patent, claims 1 & 9)

Collabo	OmniVision	Court
“any one of the floating diffusion layers corresponding to at least one of the photodiodes”	Indefinite	“any one of the floating diffusion layers corresponding to at least one of the photodiodes”

The court adopts Collabo’s proposed construction of “the floating diffusion layer,” which is supported by the intrinsic record. The ‘026 patent specification describes an arrangement of multiple photosensitive cells, each of which includes a photodiode, a transfer gate, a floating diffusion layer section, an amplifier transistor, and a reset transistor. (‘026 patent, col. 3:34-49; 5:49-57; 11:17-23) Consistent with the specification’s description of an imaging device containing numerous photosensitive cells, independent claims 1 and 9 recite a plurality of photodiodes arranged in row and column directions on a semiconductor substrate, as well as “a plurality of floating diffusion layers configured to temporarily store the transferred signal electric charge.” (‘026 patent, col. 14:8-9; 15:8-9) Claims 1 and 9 then identify the components of each photosensitive cell, providing that “each of the floating diffusion layers” is provided for “at least

one of the corresponding photodiodes and at least one of the corresponding transfer gates.”

(‘026 patent, col. 14:9-12; 15:9-12)

Subsequent references to the singular claim term “the floating diffusion layer” would be understood by one of ordinary skill in the art to refer back to each of the plurality of floating diffusion layers referenced earlier in the claim language. (‘026 patent, col. 14:17-23; 15:16-22) Nothing in the specification or claim language suggests that the patent recites a variety of distinguishable floating diffusion layers. Rather, the intrinsic record describes a multitude of photosensitive cells, each of which contains a series of fungible circuit elements, including a floating diffusion layer. (‘026 patent, col. 1:28-33; 5:55-61) The consistent usage of “floating diffusion layer” throughout the ‘026 patent enables a person of ordinary skill in the art to ascertain the scope of the invention with reasonable certainty.

OmniVision contends that claims 1 and 9 are invalid for indefiniteness because the term “the floating diffusion layer” lacks a proper antecedent basis. To provide a proper antecedent basis, “a claim must introduce a given term using an indefinite article (e.g., ‘a’ or ‘an’) before referring to it in definite form, using ‘the’ or ‘said.’” *Comcast Cable Commc’ns, LLC v. Sprint Commc’ns Co., LP*, 38 F. Supp. 3d 589, 616 (E.D. Pa. 2014) (citing *Energizer Holdings, Inc. v. Int’l Trade Comm’n*, 435 F.3d 1366, 1370 (Fed. Cir. 2006)). In the present case, OmniVision alleges that it is unclear which of the plurality of floating diffusion layers is referenced by “the floating diffusion layer,” and cautions the court against rewriting the claim language. (7/12/17 Tr. at 153:19-154:17)

However, a failure to provide antecedent basis does not necessarily render a claim indefinite if the scope of the claim would be reasonably understood by a person of ordinary skill in the art. *See Energizer Holdings, Inc. v. Int’l Trade Comm’n*, 435 F.3d 1366, 1370-71 (Fed.

Cir. 2006) (upholding validity of claims despite lack of explicit antecedent basis because intended scope of claim was reasonably ascertainable). “[A] patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014); *see also Phillips*, 415 F.3d at 1321 (“[T]he ordinary meaning of a claim term is its meaning to the ordinary artisan after reading the entire patent.”); *Eon Corp. IP Holdings v. Silver Spring Networks, Inc.*, 815 F.3d 1314, 1320 (Fed. Cir. 2016). Consistent with the Supreme Court’s holding in *Nautilus* and the policy in favor of construing claims to preserve their validity, the court concludes that a person of ordinary skill in the art would understand with reasonable certainty the scope of the invention. *See Vistan Corp. v. Fadei USA, Inc.*, 2012 WL 1496099, at *10 (N.D. Cal. Apr. 27, 2012) (“[C]laim constructions that invalidate patents are disfavored—if the scope of claims is ambiguous, they should, if possible, be construed to preserve their validity.”) (citing *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 914 (Fed. Cir. 2004)). OmniVision has not met its burden of proving by clear and convincing evidence that the lack of antecedent basis leaves one of ordinary skill in the art unable to discern the boundaries of the claim based on the intrinsic record. *See Nautilus*, 134 S. Ct. at 2129-30; *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1366 (Fed. Cir. 2011).

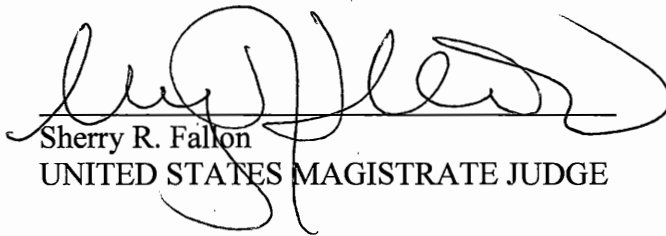
V. CONCLUSION

For the reasons set forth above, the disputed terms are construed as follows:

<u>Claim Term</u>	<u>Court's Construction</u>
"pixel signal" ('895 patent, claims 1, 3, 5)	"an electrical charge or voltage or current indicative of the intensity of light incident on the photoelectric portion of a pixel"
"every two of the unit pixel share a corresponding one of the floating diffusion portions" ('895 patent, claim 1)	"two photosensitive elements share the same floating diffusion element"
"in adjacent rows of adjacent columns" ('895 patent, claim 1)	"positioned in rows that are next to each other and in columns that are next to each other"
"contact hole" / "contact" (493 patent, claims 10 & 17; '880 patent, claim 1; '026 patent, claims 1 & 9)	"opening for making electrical connection"
"contacts are aligned in a straight line" ('026 patent, claims 1 & 9)	"contact holes are arranged along a single straight line"
"active region" ('493 patent, claims 10 & 17; '880 patent, claim 1)	"a contiguous region of the substrate through which charges can flow and where the gate, source, and drain of each transistor is formed"
"the first active region" ('493 patent, claims 10 & 17)	Indefinite
"the floating diffusion layer" ('026 patent, claims 1 & 9)	"any one of the floating diffusion layers corresponding to at least one of the photodiodes"

An Order consistent with this Memorandum Opinion shall issue.

Dated: August 25, 2017


 Sherry R. Fallon
 UNITED STATES MAGISTRATE JUDGE

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE**

COLLABO INNOVATIONS, INC.,)
)
Plaintiff,)
)
v.)
)
OMNIVISION TECHNOLOGIES, INC.,)
)
Defendant.)

Civil Action No. 16-197-JFB-SRF

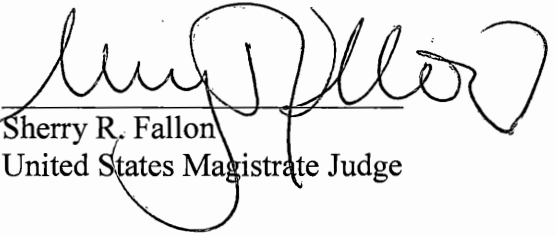
ORDER

At Wilmington this **25th** day of **August, 2017**, the court having considered the parties' briefing and argument on claim construction, and for the reasons set forth in the Memorandum Opinion issued this same date, IT IS HEREBY ORDERED THAT the disputed claim terms are construed as follows:

<u>Claim Term</u>	<u>Court's Construction</u>
"pixel signal" ('895 patent, claims 1, 3, 5)	"an electrical charge or voltage or current indicative of the intensity of light incident on the photoelectric portion of a pixel"
"every two of the unit pixel share a corresponding one of the floating diffusion portions" ('895 patent, claim 1)	"two photosensitive elements share the same floating diffusion element"
"in adjacent rows of adjacent columns" ('895 patent, claim 1)	"positioned in rows that are next to each other and in columns that are next to each other"
"contact hole" / "contact" (493 patent, claims 10 & 17; '880 patent, claim 1; '026 patent, claims 1 & 9)	"opening for making electrical connection"
"contacts are aligned in a straight line" ('026 patent, claims 1 & 9)	"contact holes are arranged along a single straight line"
"active region" ('493 patent, claims 10 & 17; '880 patent, claim 1)	"a contiguous region of the substrate through which charges can flow and where the gate, source, and drain of each transistor is formed"
"the first active region" ('493 patent, claims 10 & 17)	Indefinite

"the floating diffusion layer" ('026 patent,
claims 1 & 9)

"any one of the floating diffusion layers
corresponding to at least one of the
photodiodes"



Sherry R. Fallon
United States Magistrate Judge